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<110> Japan Science and Technology Corporation

<120> A Rotary Motor molecule V1-ATPase

<130> 03F044PCT

<140> JP2002-337212

<141> 2002-11-20

<150> PCT/JP2003/012983

<151> 2003-10-09

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<170> PatentIn Ver. 2.1

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<211> 4199

<212> DNA

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<222> (334).. (2067)

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<222> (2081).. (3514)

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Arg Lys Thr Ile Gly Phe Asp Ile Lys Leu Met Ile	
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Gln Gly Val Ile Gln Lys Ile Ala Gly Pro Ala Val Ile Ala Lys Gly	
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Pro Lys Thr Gly Gly Pro Leu Met His Arg Thr Val Leu Ile Ala Asn	
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Thr Ser Asn Met Pro Val Ala Ala Arg Glu Ala Ser Ile Tyr Val Gly	
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Val Thr Ile Ala Glu Tyr Phe Arg Asp Gln Gly Phe Ser Val Ala Leu	
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Met Ala Asp Ser Thr Ser Arg Trp Ala Glu Ala Leu Arg Glu Ile Ser	
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Ser Arg Leu Glu Glu Met Pro Ala Glu Glu Gly Tyr Pro Pro Tyr Leu	
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Leu Gly Gly Glu Glu Gly Ala Val Thr Ile Val Gly Ala Val Ser Pro	
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Pro Gly Gly Asp Met Ser Glu Pro Val Thr Gln Ser Thr Leu Arg Ile	
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Val Gly Ala Phe Trp Arg Leu Asp Ala Ser Leu Ala Phe Arg Arg His	
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Gly Tyr Met Tyr Thr Asp Leu Ala Thr Ile Tyr Glu Arg Ala Gly Val			
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Pro Asp Asp Asp Arg Thr His Pro Ile Pro Asp Leu Thr Gly Tyr Ile			
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Lys Lys Thr Thr Arg Arg Val Asn Ala Leu Glu Gln Val Val Ile Pro	
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Glu Arg Glu Asp Thr Phe Arg Leu Lys Arg Ile Lys Gly Lys Ile Glu	
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 gcc cgg gag gcc gag gag gag ggc ggc cgg ccc aac ccg cag gtg gag	4181
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<212> PRT

<213> *Thermus thermophilus*

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35 40 45
Val Asp Glu Ala Leu Leu Pro Asp Pro Glu Arg Ala Val Glu Arg Leu
50 55 60
Met Arg Gly Arg Asp Leu Pro Val Leu Leu Pro Ile Ala Gly Leu Lys
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<213> *Thermus thermophilus*

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35 40 45
Val Gln Val Tyr Glu Asp Thr Ser Gly Leu Lys Val Gly Glu Pro Val
50 55 60
Val Ser Thr Gly Leu Pro Leu Ala Val Glu Leu Gly Pro Gly Met Leu

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Asn Gly Ile Tyr Asp	Gly Ile Gln Arg	Pro Leu Glu Arg	Ile Arg Glu			
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Lys Thr Gly Ile Tyr	Ile Thr Arg Gly	Val Val Val His	Ala Leu Asp			
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Arg Glu Lys Lys Trp	Ala Trp Thr Pro	Met Val Lys Pro	Gly Asp Glu			
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His Lys Ile Leu Val	Pro Pro Asp Val	Arg Gly Arg Val	Lys Glu Val			
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Lys Pro Ala Gly Glu	Tyr Thr Val Glu	Glu Pro Val Val	Val Leu Glu			
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Asp Gly Thr Glu Leu	Lys Met Tyr His	Thr Trp Pro Val	Arg Arg Ala			
	180	185	190			
Arg Pro Val Gln Arg	Lys Leu Asp Pro	Asn Thr Pro Phe	Leu Thr Gly			
	195	200	205			
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Val Gly Val Thr Ile	Ala Glu Tyr Phe	Arg Asp Gln Gly	Phe Ser Val			
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Ala Leu Met Ala Asp	Ser Thr Ser Arg	Trp Ala Glu Ala	Leu Arg Glu			
	325	330	335			
Ile Ser Ser Arg Leu	Glu Glu Met Pro	Ala Glu Glu Gly	Tyr Pro Pro			
	340	345	350			
Tyr Leu Ala Ala Arg	Leu Ala Ala Phe	Tyr Glu Arg Ala	Gly Lys Val			
	355	360	365			
Ile Thr Leu Gly Gly	Glu Glu Gly Ala	Val Thr Ile Val	Gly Ala Val			
	370	375	380			
Ser Pro Pro Gly Gly	Asp Met Ser Glu	Pro Val Thr Gln	Ser Thr Leu			
385	390	395	400			
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 Ser Ala Leu Asp Pro Trp Tyr Arg Glu Asn Val Ala Glu Asp Tyr Pro
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 Glu Leu Arg Asp Ala Ile Ser Glu Leu Leu Gln Arg Glu Ala Gly Leu
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 Tyr Gly Ile Met Lys Met Ile Leu Ala Phe Tyr Lys Glu Ala Glu Ala
 515 520 525
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 530 535 540
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 <213> *Thermus thermophilus*

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 35 40 45
 Glu Val Ser Glu Glu Tyr Ala Val Ile Gln Val Phe Glu Glu Thr Thr
 50 55 60
 Gly Leu Asp Leu Ala Thr Thr Ser Val Ser Leu Val Glu Asp Val Ala
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 Arg Leu Gly Val Ser Lys Glu Met Leu Gly Arg Arg Phe Asn Gly Ile
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Pro Ile Thr Gly Leu Pro Leu Asn Pro Val Ala Arg Arg Lys Pro Glu
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 Val Arg Gly Gln Lys Leu Pro Ile Phe Ser Gly Ser Gly Leu Pro Ala
 145 150 155 160
 Asn Glu Ile Ala Ala Gln Ile Ala Arg Gln Ala Thr Val Arg Pro Asp
 165 170 175
 Leu Ser Gly Glu Gly Glu Lys Glu Glu Pro Phe Ala Val Val Phe Ala
 180 185 190
 Ala Met Gly Ile Thr Gln Arg Glu Leu Ser Tyr Phe Ile Gln Glu Phe
 195 200 205
 Glu Arg Thr Gly Ala Leu Ser Arg Ser Val Leu Phe Leu Asn Lys Ala
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 Asp Asp Pro Thr Ile Glu Arg Ile Leu Thr Pro Arg Met Ala Leu Thr
 225 230 235 240
 Val Ala Glu Tyr Leu Ala Phe Glu His Asp Tyr His Val Leu Val Ile
 245 250 255
 Leu Thr Asp Met Thr Asn Tyr Cys Glu Ala Leu Arg Glu Ile Gly Ala
 260 265 270
 Ala Arg Glu Glu Ile Pro Gly Arg Arg Gly Tyr Pro Gly Tyr Met Tyr
 275 280 285
 Thr Asp Leu Ala Thr Ile Tyr Glu Arg Ala Gly Val Val Glu Gly Lys
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 Lys Gly Ser Val Thr Gln Ile Pro Ile Leu Ser Met Pro Asp Asp Asp
 305 310 315 320
 Arg Thr His Pro Ile Pro Asp Leu Thr Gly Tyr Ile Thr Glu Gly Gln
 325 330 335
 Ile Gln Leu Ser Arg Glu Leu His Arg Lys Gly Ile Tyr Pro Pro Ile
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 Asp Pro Leu Pro Ser Leu Ser Arg Leu Met Asn Asn Gly Val Gly Lys
 355 360 365
 Gly Lys Thr Arg Glu Asp His Lys Gln Val Ser Asp Gln Leu Tyr Ser
 370 375 380
 Ala Tyr Ala Asn Gly Val Asp Ile Arg Lys Leu Val Ala Ile Ile Gly
 385 390 395 400
 Glu Asp Ala Leu Thr Glu Asn Asp Arg Arg Tyr Leu Gln Phe Ala Asp
 405 410 415
 Ala Phe Glu Arg Phe Phe Ile Asn Gln Gly Gln Gln Asn Arg Ser Ile
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 Glu Glu Ser Leu Gln Ile Ala Trp Ala Leu Leu Ser Met Leu Pro Gln
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 <213> *Thermus thermophilus*

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 35 40 45
 Ala Arg Lys Ala Leu Asp Gln Ala Ala Lys Glu Ala Tyr Ala Ala Leu
 50 55 60
 Leu Leu Ala Gln Ala Phe Asp Gly Pro Glu Val Val Ala Gly Ala Ala
 65 70 75 80
 Leu Gly Val Pro Pro Leu Glu Gly Val Glu Ala Glu Val Glu Asn Val
 85 90 95
 Trp Gly Ser Lys Val Pro Arg Leu Lys Ala Thr Phe Pro Asp Gly Ala
 100 105 110
 Leu Leu Ser Pro Val Gly Thr Pro Ala Tyr Thr Leu Glu Ala Ser Arg
 115 120 125
 Ala Phe Arg Arg Tyr Ala Glu Ala Leu Ile Arg Val Ala Asn Thr Glu
 130 135 140
 Thr Arg Leu Lys Lys Ile Gly Glu Glu Ile Lys Lys Thr Thr Arg Arg
 145 150 155 160
 Val Asn Ala Leu Glu Gln Val Val Ile Pro Gly Ile Arg Ala Gln Ile
 165 170 175
 Arg Phe Ile Gln Gln Val Leu Glu Gln Arg Glu Arg Glu Asp Thr Phe
 180 185 190
 Arg Leu Lys Arg Ile Lys Gly Lys Ile Glu Ala Arg Glu Ala Glu Glu
 195 200 205
 Glu Gly Gly Arg Pro Asn Pro Gln Val Glu Ile Gly Ala Gly Leu
 210 215 220